

MR1035-1334

Serial Number: 10/714,653

Reply to Office Action dated 8 April 2005

AMENDMENTS TO THE SPECIFICATION

I. Please replace the SPECIFICATION, pages 1 - 6, with the following amended SPECIFICATION:

BACKGROUND OF THE INVENTION

1. Field of the Invention

[0001] The present invention relates in general to an adjustable riveter apparatus for pulling a screw column, and more particularly, to control a length of the screw column for different screws.

2. Description of the Related Art

[0002] The riveter apparatus is a very common tool in at a construction site for a pulling screw column. The riveter apparatus makes a position head from by pulling a plate, than uses a column to connect to a front end of a rod of the riveter apparatus, and the riveter apparatus through a hole on a board. While pressing a handle of the riveter apparatus, the rod will back and change the column shape so as to fix it to on the board. The changed column is made from the result of the rod dragging force and the column backing force, so the distance of dragging is relative to the quality of the riveter apparatus. Further, if the rod dragging force is too big to over the distance of large and deforms the column more than needed, the column will be destroyed under the handle pressing force and affect the quality of construction. It is It's also have a problem, while where the rod dragging force is

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too small to adequately deform ~~change~~ the column, the column is not ~~effectiveness~~ effective. In the past, the riveter apparatus can not be adjusted for pulling distance, so the ~~column must to be keeping changed by pressing the handle of riveter~~ apparatus must be pressed until the optimal distance ~~formed~~ is achieved. ~~It makes~~ That results in the column ~~to being easily~~ destroyed easily, and ~~should be requires~~ rework. In order to solve the above problem and save working time, the present invention provides an adjustable riveter apparatus for adjusting the displacement distance of the column so as to improve the quality of construction and prevent the column ~~to from being~~ destroyed.

SUMMARY OF THE INVENTION

[0003] It is an object of this invention to provide a riveter apparatus for adjusting ~~the skew~~ a screw column and easy ~~controlling~~ control of the pulling force. Further, it is an object to achieve high quality construction with the riveter apparatus.

[0004] It is another object of this invention to provide a riveter apparatus for adapting to different construction ~~sits~~ conditions to prevent the column thread ~~to from being~~ destroyed. ~~To make skew column with the riveter apparatus of present invention is more convenient and efficient.~~

[0005] It is still another object of this invention to provide a riveter apparatus for ~~adjusting the fine skew column~~. It can be more precise ~~to control of~~ the column distance ~~to form~~.

[0006] It is to be understood that both the foregoing general description and the following detailed description are exemplary and explanatory only and are not restrictive of the invention, as claimed.

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BRIEF DESCRIPTION OF THE DRAWINGS

[0007] Figure 1 ~~shows is~~ is a partial cross-sectional view of cross-section of ~~whole the~~ riveter apparatus ~~according to~~ of the present invention;

[0008] Figure 2 ~~shows is~~ is a partial cross-sectional view of cross-section of ~~combination a portion~~ of the present invention;

[0009] Figure 3 ~~shows is~~ is a partial cross-sectional view of cross-section of a rod of the present invention.;

[0010] Figure 4 and 5 ~~shows are~~ illustrations showing adjustment of the riveter apparatus ~~to make an adjustment according to~~ of the present invention;

[0011] Figure 6 ~~shows is~~ an illustration of operation of different type is ~~made from the~~ riveter apparatus ~~according to~~ of the present invention adapted for a different type of fastener;

[0012] Figure 7 ~~shows is~~ an illustration of operation about of the riveter apparatus ~~according to~~ of the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0013] Referring to Figures 1, 2 and 3, the present invention includes a body 10, a holding part 30 and a pulling part 50. The body 10 has a base 11 and a front tube 12. There is a column 13 inside the base 11. The column 13 further has an adjustable groove 14 with ~~great large~~ large diameter in end of the adjustable groove 14, a ~~cylinder~~ cylindrical portion 15 with a smaller diameter in the middle of the tube ~~than others~~, and a chamfer 16 with front thread. In the end of the base 11, there is a slot 17 extending through the adjustable groove 14, as shown in figure 3 ~~shown~~. The front tube 12 is a hollow-shaped. There is a threaded part 18 in one end of the front tube 12, so as to spin along the screw into the chamfer 16 of the

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column 13. An opening 19 is formed in the front end of the front tube 12, and there is a bolt 21 and a cap 22 on top of the bolt 21 that are fixed ~~on~~ in the opening 19 of the front tube 12. The bolt also has a channel 23 formed therethrough.

[0014] The holding part includes a pair of outside-arms 31, inside-arms 32, handles 33 and push arms 34. The outside-arms 31 connect to two sides of the body 11, respectively. The inside-arms 32 connect to the end of outside-arms 31, respectively, and the push-arms 34 connect to the end of inside-arm 32. Each of portions of the holding part ~~can~~ are linked together to move. Furthermore, a perforation 35 is formed in the middle of the push-arms 34.

[0015] The pulling part 50 ~~is extends~~ through the inside of the base 11 and front tube 12 of the body 10. ~~[[, the]]~~ The pulling part 50 includes an adjustable nut 51, and an adjustable rod 53. The adjustable nut 51 is positioned on the adjustable groove 14 of the column 13. Outside the column, there is a notch 511, as figure 3 shows. The notch 511 ~~can be~~ will receive a shaft 512 that is can be extended through the slot 17 of the body 11 ~~to place~~. When ~~As~~ the shaft 512 extends through the slot 17 of the body 11 ~~than place on to be disposed in the~~ notch 511, the adjustable nut 51 in the adjustable hole 14 only can move along the axis axially and cannot rotate. Inside the adjustable nut 51, the front end thereof ~~has~~ is a small thread 513, and the back end is ~~has~~ a bigger diameter ~~axle-center~~ centrally disposed axial bore 514. Furthermore, on the outside of the adjustable nut 51, there is a scale for precise adjusting of the length. The adjustable ~~rode~~ rod 52 is extends through the push arm 34 and the adjustable nut 51, which includes a front thread 521, a recess 522 and a pattern end 524. The front thread 521 connects to the screw section 513 of adjustable nut 51. The recess 522 has a space for placing a washer 525 so as to provide accurate adjust ~~accurately~~ and avoid slipping. The

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stopping channel 523 is extends through the perforation 35 of the push-arms 34 that makes the push-arms 34 to fix on the stopping channel 523, so the adjustable rod 52 can be rotatively operated to revolve. The ~~pattern~~ end 524 has a pattern formed therein that aids a user ~~can use~~ to rotate the adjustable rod 52. Further, the front end of adjustable rod 52 has a screw hole to turn to the rod 53. ~~In~~ The front end of rod 53 passes is through the bolt 21 and has another screw section 531, which ~~turns~~ is threaded into the screw tube for constructing pulling work.

[0016] Referring to figure 4 and 5, there is shown, the ~~shows~~ adjusting process ~~about~~ for adjusting the pulling distance in present invention. In figure 4, while the holder is opened, the push-arms 34 impels the pulling part 50 to the front till the adjustable nut 51 touch the end of adjustable channel 14 to stop, which is the limit distance, b, of the holder 33 ~~can be~~. While turning the patterned end 524 of adjustable rod 52 ~~in-situ~~, the adjustable nut 51 is impelled to ~~back~~ a displacement, c, that is opposite to the adjustable rod 52. As the end of adjustable nut 51 and adjustable channel 14 has been adjusted a displacement, c, the holder 33 also can be expanded a distance greater than displacement a, and the pulling part 50 can be impelled a distance more than displacement b by push-arms 34, as shown that shows on figure 5. So, if the holder 33 opens a greater distance or greater degree, the pulling part 50 and the screw section 531 will protrude. As ~~above described above~~, pressuring the holder 33 to operate the pulling process, the pulling part 50 could be backed out a greater distance so as to provide a greater adjusting space. To reduce the distance in the pulling process, which can ~~invert~~ reverse the operation of adjustable nut 51 and adjustable rod 52 ~~operate way of~~ above as described above.

[0017] Next, with reference to FIGS. 7, in the operation ~~above~~ of the

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present invention, ~~does moves~~ the first step is to connect to the thread 531 of the end of pulling part 50, ~~and then to the screw tube 75~~ through a perforation 71 of an operating board 70. At the same time, pressing the holder 33 of riveter apparatus makes the pulling part 50 move back to pull so the screw tube 75, has ~~been changed which changes~~ its shape 721 and is thereby fixed on the operating board 70. Referring to figure 6, ~~It shows the riveter apparatus is made adapted for a fastener of a different shapes from different operation steps~~ shape.

[0018] ~~The opposite site of~~ Instead of an internally threaded screw tube 75, the fastener has a ~~and riveter is~~ screw rod 751. The rod 53 in connects to the front end of pulling part 751 and is constructed with an inner screw section. By ~~connected~~ connection to this inner screw section 533 and the screw rod 751 in the front end of screw tube 75, ~~we can proceed the riveter process and then make operation causes~~ the distortion 752 of screw tube 75.

[0019] As ~~we mentioned~~ above, this invention is ~~about~~ directed to the design of the adjustment of adjustable nut 51 and the screw connection of adjustable nut with the adjustable shaft 52 in of pulling part 50. If ~~we adjusted~~ the screw cap 51 is adjusted, ~~we can make the~~ there can be made a lateral motion by a cross-linked reaction of pulling part 50. ~~And then we can improve the~~ The quality of the riveter process can be improved by the adjustment of pulling force and moment movement. And ~~we have~~ there is a fine scale apparatus on the adjustable nut 51. The ~~We can accurately control the adjustment~~ can be accurately controlled by adjusting the moving quantities read out by the scale apparatus. Finally, ~~we can obtain accurate operation and quality of pulling cap~~ can be obtained.

~~[0020] The invention thus has the advantage that the scan mode is automatically determined. The user does not have to judge the correct scan mode~~

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~~of the scanner by himself/herself.~~

[0021] ~~Another~~ Other embodiments of the invention will appear to those skilled in the art from consideration of the specification and practice of the invention disclosed herein. It is intended that the specification and examples to be considered as exemplary only, with ~~a~~ the true scope and spirit of the invention being indicated by the following claims.

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SUBSTITUTE SPECIFICATION

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates in general to an adjustable riveter apparatus for pulling a screw column, and more particularly, to control a length of the screw column for different screws.

2. Description of the Related Art

The riveter apparatus is a very common tool at a construction site for a pulling screw column. The riveter apparatus makes a position head by pulling a plate, then uses a column to connect to a front end of a rod of the riveter apparatus, through a hole on a board. While pressing a handle of the riveter apparatus, the rod will back and change the column shape so as to fix it to the board. The changed column is the result of the rod dragging force and the column backing force, so the distance of dragging is relative to the quality of the riveter apparatus. Further, if the rod dragging force is too large and deforms the column more than needed, the column will be destroyed under the handle pressing force and affect the quality of construction. It is also a problem where the rod dragging force is too small to adequately deform the column, the column is not effective. In the past, the riveter apparatus can not be adjusted for pulling distance, so the handle of riveter apparatus must be pressed until the optimal distance is achieved. That results in the column being easily destroyed, and requires rework. In order to solve the

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above problem and save working time, the present invention provides an adjustable riveter apparatus for adjusting the displacement distance of the column so as to improve the quality of construction and prevent the column from being destroyed.

SUMMARY OF THE INVENTION

It is an object of this invention to provide a riveter apparatus for adjusting a screw column and easy control of the pulling force. Further, it is an object to achieve high quality construction with the riveter apparatus.

It is another object of this invention to provide a riveter apparatus for adapting to different construction conditions to prevent the column thread ~~to~~ from being destroyed.

It is still another object of this invention to provide a riveter apparatus for precise control of the column distance.

It is to be understood that both the foregoing general description and the following detailed description are exemplary and explanatory only and are not restrictive of the invention, as claimed.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a partial cross-sectional view of the riveter apparatus of the present invention;

Figure 2 is a partial cross-sectional view of a portion of the present invention;

Figure 3 is a partial cross-sectional view of a rod of the present invention.;

Figure 4 and 5 are illustrations showing adjustment of the riveter apparatus of the present invention;

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Figure 6 is an illustration of operation of the riveter apparatus of the present invention adapted for a different type of fastener;

Figure 7 is an illustration of operation of the riveter apparatus of the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to Figures 1, 2 and 3, the present invention includes a body 10, a holding part 30 and a pulling part 50. The body 10 has a base 11 and a front tube 12. There is a column 13 inside the base 11. The column 13 further has an adjustable groove 14 with large diameter in end of the adjustable groove 14, a cylindrical portion 15 with a smaller diameter in the middle of the tube, and a chamfer 16 with front thread. In the end of the base 11, there is a slot 17 extending through the adjustable groove 14, as shown in figure 3. The front tube 12 is hollow-shaped. There is a threaded part 18 in one end of the front tube 12, so as to spin along the screw into the chamfer 16 of the column 13. An opening 19 is formed in the front end of the front tube 12, and there is a bolt 21 and a cap 22 on top of the bolt 21 that are fixed in the opening 19 of the front tube 12. The bolt also has a channel 23 formed therethrough.

The holding part includes a pair of outside-arms 31, inside-arms 32, handles 33 and push arms 34. The outside-arms 31 connect to two sides of the body 11, respectively. The inside-arms 32 connect to the end of outside-arms 31, respectively, and the push-arms 34 connect to the end of inside-arm 32. Each of portions of the holding part are linked together to move. Furthermore, a perforation 35 is formed in the middle of the push-arms 34.

The pulling part 50 extends through the inside of the base 11 and front tube

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12 of the body 10. The pulling part 50 includes an adjustable nut 51, and an adjustable rod 53. The adjustable nut 51 is positioned on the adjustable groove 14 of the column 13. Outside the column, there is a notch 511, as figure 3 shows. The notch 511 will receive a shaft 512 that can be extended through the slot 17 of the body 11. When the shaft 512 extends through the slot 17 of the body 11 to be disposed in the notch 511, the adjustable nut 51 in the adjustable hole 14 only can move along axially and cannot rotate. Inside the adjustable nut 51, the front end thereof has a small thread 513, and the back end has a bigger diameter centrally disposed axial bore 514. Furthermore, on the outside of the adjustable nut 51, there is a scale for precise adjusting of the length. The adjustable rod 52 extends through the push arm 34 and the adjustable nut 51, which includes a front thread 521, a recess 522 and a pattern end 524. The front thread 521 connects to the screw section 513 of adjustable nut 51. The recess 522 has a space for placing a washer 525 so as to provide accurate adjust and avoid slipping. The stopping channel 523 extends through the perforation 35 of the push-arms 34 that makes the push-arms 34 to fix on the stopping channel 523, so the adjustable rod 52 can be rotatively operated to revolve. The end 524 has a pattern formed therein that aids a user to rotate the adjustable rod 52. Further, the front end of adjustable rod 52 has a screw hole to turn to the rod 53. The front end of rod 53 passes is through the bolt 21 and has another screw section 531, which is threaded into the screw tube for constructing pulling work.

Referring to figure 4 and 5, there is shown, the adjusting process for adjusting the pulling distance in present invention. In figure 4, while the holder is opened, the push-arms 34 impels the pulling part 50 to the front till the adjustable nut 51 touch the end of adjustable channel 14 to stop, which is the limit distance,

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b, of the holder 33. While turning the patterned end 524 of adjustable rod 52, the adjustable nut 51 is impelled to a displacement, c, that is opposite to the adjustable rod 52. As the end of adjustable nut 51 and adjustable channel 14 has been adjusted a displacement, c, the holder 33 also can be expanded a distance greater than displacement a, and the pulling part 50 can be impelled a distance more than displacement b by push-arms 34, as shown on figure 5. So, if the holder 33 opens a greater distance or greater degree, the pulling part 50 and the screw section 531 will protrude. As described above, pressuring the holder 33 to operate the pulling process, the pulling part 50 could be backed out a greater distance so as to provide a greater adjusting space. To reduce the distance in the pulling process, which can reverse the operation of adjustable nut 51 and adjustable rod 52 as described above.

Next, with reference to FIGS. 7, in the operation of the present invention, the first step is to connect the thread 531 of the end of pulling part 50 to the screw tube 75 through a perforation 71 of an operating board 70. At the same time, pressing the holder 33 of riveter apparatus makes the pulling part 50 move back to pull so the screw tube 75, which changes its shape 721 and is thereby fixed on the operating board 70. Referring to figure 6, the riveter apparatus is adapted for a fastener of a different shape.

Instead of an internally threaded screw tube 75, the fastener has a screw rod 751. The rod 53 connects to the front end of pulling part 751 and is constructed with an inner screw section. By connection to this inner screw section 533 and the screw rod 751 in the front end of screw tube 75, the riveter operation causes the distortion 752 of screw tube 75.

As mentioned above, this invention is directed to the design of the

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adjustment of adjustable nut 51 and the screw connection of adjustable nut with the adjustable shaft 52 of pulling part 50. If the screw cap 51 is adjusted, there can be made a lateral motion by a cross-linked reaction of pulling part 50. The quality of the riveter process can be improved by the adjustment of pulling force and movement. And there is a fine scale apparatus on the adjustable nut 51. The adjustment can be accurately controlled by adjusting the moving quantities read out by the scale apparatus. Finally, accurate operation and quality of pulling cap can be obtained.

Other embodiments of the invention will appear to those skilled in the art from consideration of the specification and practice of the invention disclosed herein. It is intended that the specification and examples to be considered as exemplary only, with the true scope and spirit of the invention being indicated by the following claims.